Claims

1. Leak detection apparatus for a liquid cooling system having coolant pipes and at least one pipe joint, comprising:

a wicking material applied to an exterior periphery of said pipe;

an electrical detector including first and second spaced electrodes disposed on said wicking material;

an activating agent impregnated into said wicking material that is operative when leaked coolant soaks into said wicking material for altering an electrical parameter of said electrical detector; and

circuitry coupled to said electrical detector for indicating the presence of a coolant leak in response to said altering of said electrical parameter.

2. The leak detection apparatus of Claim 1, further comprising:

a superincumbent layer of material surrounding said electrical detector and wicking material that is operative on contact with said leaked coolant for hardening to form a seal that contains said leaked coolant.

3. The leak detection apparatus of Claim 2, wherein said coolant is water, and said superincumbent layer is hydrophobic polyurethane.

4. The leak detection apparatus of Claim 1, wherein said first and second electrodes have a similar composition, said activating agent is a crystalline salt, and said altered electrical parameter is an electrical resistance between said first and second electrodes.

5. The leak detection apparatus of Claim 1, wherein said first and second electrodes are formed of different metals, said activating agent is a crystalline electrolyte, and said altered electrical parameter is an electrical voltage and current flow between said first and second electrodes.

6. The leak detection apparatus of Claim 1, further comprising:

a dye material impregnated into said wicking material that is operative when leaked coolant soaks into said wicking material for dying said wicking material to provide a visual indicator of the leaked coolant.

7. The leak detection apparatus of Claim 1, wherein:

said first and second electrodes are radially spaced about said pipe; and

a portion of said wicking material is disposed between said first and second electrodes.

8. The leak detection apparatus of Claim 7, wherein at least one of said first and second electrodes is a screen that allows said leaked coolant to soak into said portion of wicking material disposed between said first and second electrodes.

9. The leak detection apparatus of Claim 1, wherein:

said first and second electrodes are laterally and oppositely disposed about said pipe joint.

10. The leak detection apparatus of Claim 9, wherein:

said first and second electrodes clamp said wicking material around said pipe joint.

11. The leak detection apparatus of Claim 1, wherein:

said first and second electrodes are in the form of plates oriented substantially perpendicular to said coolant pipe, and

a portion of said wicking material is disposed between said first and second electrodes.

12. The leak detection apparatus of Claim 11, wherein said first and second electrodes are formed of different metals, said activating agent is a crystalline electrolyte, and said altered electrical parameter is an electrical voltage and current flow between said first and second electrodes.

13. The leak detection apparatus of Claim 12, wherein said electrical detector includes third and fourth electrodes formed of different metals, and electrically coupled to said first and second electrodes, respectively, to form a multi-cell coolant activated battery.

14. The leak detection apparatus of Claim 11, wherein said first and second electrodes and said wicking material have a semi-cylindrical periphery that seats on said coolant pipe.

15. The leak detection apparatus of Claim 14, wherein said electrical detector includes third and fourth plate electrodes and intervening wicking

material having a semi-cylindrical periphery that seats on said coolant pipes about said coolant pipe in opposition to said first and second electrodes.

16. The leak detection apparatus of Claim 15, wherein said first and second electrodes are electrically coupled to said third and fourth electrodes, respectively, to form a multi-cell coolant activated battery.

17. The leak detection apparatus of Claim 1, wherein:

said first and second electrodes and wicking material are in the form of an elongated strip that is spirally wrapped around said coolant pipes.

18. Leak detection apparatus for a liquid cooling system, comprising:

a metal foil member having a central opening, and adhesively secured to a component of said system;

an electrical detection including first and second spaced electrodes disposed on said foil member oppositely about said central opening;

a sheet of wicking material spanning the central opening of said foil member, and having marginal portions supported by said foil member;

an activating agent impregnated into said wicking material that is operative when leaked coolant at said component soaks into said wicking material for altering an electrical parameter of said electrical detector; and

means coupled to said electrical detector for indicating the presence of a coolant leak in response to said altering of said electrical parameter.

19. The leak detection apparatus of Claim 18, further comprising:

a superincumbent layer of material surrounding said electrical detector and wicking material that is operative on contact with said leaked coolant for hardening to form a seal that contains said leaked coolant.

20. The leak detection apparatus of Claim 18, wherein said first and second electrodes have a similar composition, said activating agent is a crystalline salt, and said altered electrical parameter is an electrical resistance between said first and second electrodes.